

Application No. 10/828,575

SUPPLEMENTAL AMENDMENT UNDER 37 C.F.R. § 1.111 dated October 15, 2009

Reply to Office Communication of May 27, 2009 and Office Action of July 25, 2008

AMENDMENTS TO THE CLAIMS

This listing of claims will replace all prior versions, and listings, of claims in the application:

Listing of Claims:

1. (Currently Amended) A method for querying [[any]] at least one of a plurality of target databases for one or more target database records that match an input data query, said method comprising ~~the steps of:~~

querying a reference database selected from among a plurality of reference databases based on an input data type for a reference database record that matches the input data,

[[if]] in response to finding a matching reference database record ~~is found~~, querying [[any]] at least one of the plurality of target databases for the one or more target database records that correspond to the reference database record, and

retrieving those target database records that correspond to the reference database record.

2. (Currently Amended) The method of claim 1 further comprising ~~the step of~~ generating a request to enter a new input data query [[if]] in response to failing to find a reference database record ~~is not found~~.

3. (Currently Amended) The method of claim 1 wherein said ~~step of~~ querying a reference database comprises querying the reference database for reference database records that possibly match the input data, the method further comprising ~~the steps of~~:

[[if]] in response to failing to find a matching reference database record ~~is not found~~ but finding one or more possibly matching reference database records ~~are found~~, determining [[if]] whether a possibly matching record can be considered a near-matching record to the input data, and

[[if]] in response to identifying a near-matching record ~~is determined~~, querying [[any]] at least one of the plurality of target databases for the one or more target database records that correspond to the near-matching record.

4. (Currently Amended) The method of claim 3 further comprising ~~the steps of~~:

[[if]] in response to determining that a matching reference database record is not found and one or more possibly matching reference database records are found but a near-matching record is not ~~determined found~~, generating a selection request to choose from among the one or more possibly matching records a record that corresponds to the input data,

[[if]] in response to finding a possibly matching record that corresponds to the input data and is chosen, querying [[any]] at least one of the plurality of target databases for the one or more target database records that correspond to the chosen record.

5. (Canceled)

6. (Currently Amended) The method of claim 1 wherein the ~~step of~~ querying any of the plurality of target databases further comprises, [[if]] in response to finding a matching reference database record ~~is found~~, querying for records that possibly correspond to the reference database record.

7. (Currently Amended) A method for querying one or more target databases for one or more target database records, said method comprising ~~the steps of~~:

receiving an input data query,

based on an input data type, selecting from among a plurality of reference databases one or more reference databases,

[[if]] in response to selection of a single reference database is selected:

querying the single reference database for a reference database record that matches the input data,

~~if a matching reference database record is found,~~ using [[the]] a matching reference database record found by the querying for subsequent queries of the one or more target databases for the one or more target database records, and

retrieving those target database records that correspond to the matching reference database records.

8. (Currently Amended) The method of claim 7 wherein said using [[step]] comprises ~~the steps of~~ converting the matching reference database record to a single canonical form and using the canonical form for querying the one or more target databases for the one or more target database records.

9. (Currently Amended) The method of claim 7 wherein said using [[step]] comprises ~~the steps of~~ converting the matching reference database record to one or more canonical forms wherein each canonical form corresponds to one of the one or more target databases and using each canonical form for querying its corresponding target database for the one or more target database records.

10. (Currently Amended) The method of claim 7 wherein said using ~~[[step]]~~ comprises ~~the steps of~~ removing information from the matching reference database record and subsequently using any remaining information for the subsequent queries of the one or more target databases for the one or more target database records.

11. (Currently Amended) The method of claim 7 wherein the matching reference database record comprises additional information beyond the input data query and wherein said using ~~[[step]]~~ comprises ~~the steps of~~:

separating the information of the matching reference database record to create a plurality of forms, and

using the plurality of forms for the subsequent queries of the one or more target databases for the one or more target database records.

12. (Currently Amended) The method of claim 7 ~~wherein if~~ further comprising, in response to selection of multiple reference databases ~~are selected~~:

sequentially querying the multiple reference databases until a reference database record that matches the input data is found, and

~~[[if]]~~ in response to finding a matching reference database record ~~is found~~, using the matching reference database record for subsequent queries of one or more target databases for one or more target database records.

13. (Currently Amended) The method of claim 7 ~~wherein if~~ further comprising, in response to selection of multiple reference databases ~~are selected~~:

querying the multiple reference databases in parallel for all reference database records that match the input data, and

[[if]] in response to finding one or more matching reference database records ~~are found~~:

selecting one of the matching reference database records, and
using the matching reference database record for subsequent queries of
one or more target databases for one or more target database records.

14. (Currently Amended) The method of claim 13 wherein said selecting [[step]] is based on whether there is a quorum among the one or more matching reference database records.

15. (Currently Amended) The method of claim 7 ~~wherein if~~ further comprising, in response to selection of multiple reference databases ~~are selected~~:

querying the multiple reference databases for all reference database records that match the input data, and

[[if]] in response to finding one or more matching reference database records ~~are found~~, using each matching reference database record for subsequent queries of one or more target databases for one or more target database records.

16. (Currently Amended) A system for querying one or more target databases for one or more target database records in a ~~processor~~ computing device, said system comprising:

a set of reference-based mapping rules for matching input data queries to reference database records,

a set of target-based query rules for matching reference database records to target database records,

a validation and mapping process that given an input data query, uses the set of reference-based mapping rules to match ~~[[a]]~~ at least one record in ~~[[a]]~~ at least one selected reference database to the given input data, and uses the target-based query rules to match the one or more target database records in the one or more target databases to the at least one matched reference database record or to a canonical form of the matched reference database record

a reference database list specifying relations between input data types and reference databases and wherein the validation and mapping process uses the reference database list to determine the at least one selected reference database, and

retrieval of a list of identified target database records.

17. (Canceled)

18. (Original) The system of claim 16 further comprising a list of transformation rules for converting reference database records to canonical forms.

19. (Original) The system of claim 18 wherein the list of transformation rules are also for converting reference database records to customized canonical forms that correspond to the target databases.

20. (New) The method of claim 1 wherein said input data is parsed into component data parts, and said selected reference database is selected to individually validate the component data parts by

selecting at least one reference database based on the type of component data part and querying the reference database to select a reference database record that matches the component data part, and

in response to finding a matching database record, storing the matching reference database record;

in response to finding matching reference database records for each component data part, combining each stored matching reference database records and using the combined records for subsequent queries of one or more target databases for one or more target database records.

21. (New) The method of claim 7 further comprising:

parsing the input data into component data parts,

sequentially querying the selected reference databases to individually validate the component data parts by

selecting at least one reference database based on the type of component data part and querying the reference database to select a reference database record that matches the component data part, and

storing a matching reference database record found as a result of the querying the reference database,

combining stored matching reference database records and using the combined records for subsequent queries of one or more target databases for one or more target database records.

22. (New) A method for querying at least one of a plurality of target databases for one or more target database records that match an input data query, said method comprising:

- querying a reference database populated with known or expected variations on the input data for a reference database record that matches the input data,
- in response to finding a matching reference database record, querying at least one of the plurality of target databases for the one or more target database records that correspond to the reference database record, and
- retrieving those target database records that correspond to the reference database record.

23. (New) The method of claim 22 further comprising generating a request to enter a new input data query in response to failing to find a reference database record.

24. (New) The method of claim 22 wherein said querying a reference database comprises querying the reference database for reference database records that possibly match the input data, the method further comprising:

- in response to failing to find a matching reference database record but finding one or more possibly matching reference database records, determining whether a possibly matching record can be considered a near-matching record to the input data, and

- in response to identifying a near-matching record, querying at least one of the plurality of target databases for one or more target database records that correspond to the near-matching record.

25. (New) The method of claim 24 further comprising:

in response to failing to find a matching reference database record and finding one or more possibly matching reference database records but failing to identify a near-matching record, generating a selection request to choose from among the one or more possibly matching records a record that corresponds to the input data,

in response to a possibly matching record that corresponds to the input data and is chosen, querying at least one of the plurality of target databases for the one or more target database records that correspond to the chosen record.

26. (New) The method of claim 22 wherein prior to querying the reference database, the reference database is selected from among a plurality of reference databases based on an input data type.

27. (New) An apparatus comprising:

a reference query engine, configured to receive an input data query and, based on an input data type, query one or more reference databases; and

a target query engine, configured to query one or more target databases in response to finding a matching reference database record as a result of a reference query engine query.

28. (New) The apparatus of claim 27 wherein the reference query engine is configured with a set of mapping rules to match input data queries to reference database records.

29. (New) The apparatus of claim 27 wherein the target query engine is configured with a set of target-based query rules to match reference database records to target database records.

30. (New) The apparatus of claim 27 wherein the reference query engine is configured to search the one or more reference databases sequentially.

31. (New) The apparatus of claim 30 wherein the reference query engine is configured to parse the input data into component parts and to conduct multi-stage validation of the input data by querying one or more reference databases using each component part.

32. (New) The apparatus of claim 27 wherein the reference query engine is configured to search the one or more reference databases in parallel.

33. (New) The apparatus of claim 32 wherein the reference query engine is configured to select a matching reference database record based on whether there is a quorum among one or more matching reference database records.

34. (New) The apparatus of claim 27 wherein the reference query engine is configured to reduce matching reference database records to a single canonical form and the target query engine is configured to query the one or more target databases using the single canonical form.

35. (New) The apparatus of claim 27 wherein the reference query engine is configured to reduce matching reference database records to one or more canonical forms wherein each canonical form corresponds to one or more target databases and where the target query engine is configured to query the one or more target databases using the canonical form corresponding to that one or more target databases.

36. (New) A tangible computer-readable medium having stored thereon computer-executable instructions that are configured to cause the computing device to:

receive input data,

select from a plurality of reference databases at least one reference database based on the type of input data,

query the at least one reference database for a reference database record that matches the input data,

if a matching reference database record is found, query any of a plurality of target databases for one or more target database records that correspond to the reference database record, and

retrieve target database records that correspond to the reference database record.

37. (New) The tangible computer-readable medium of claim 36, wherein the computer-executable instructions further comprise instructions configured to cause the computing device to:

generate a request for new input data if a matching reference database record is not found.

38. (New) The tangible computer-readable medium of claim 36, wherein the computer-executable instructions further comprise instructions configured to cause the computing device to:

generate a request to select from among one or more possibly matching reference database records.